

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

**Mastery Assessment of Unit 2 (Practice version 112)****Question 1**

Let  $f$  represent a function. If  $f[34] = 47$ , then there exists a knowable solution to the equation below.

$$y = \frac{f\left[\frac{x}{13} + 31\right] + 45}{4}$$

Find the solution.

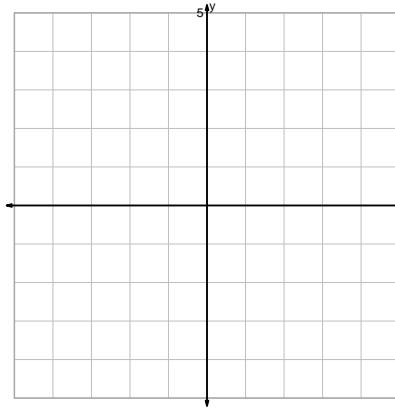
$$x =$$

$$y =$$

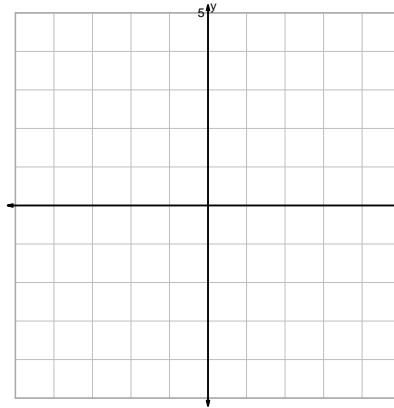
**Question 2**

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

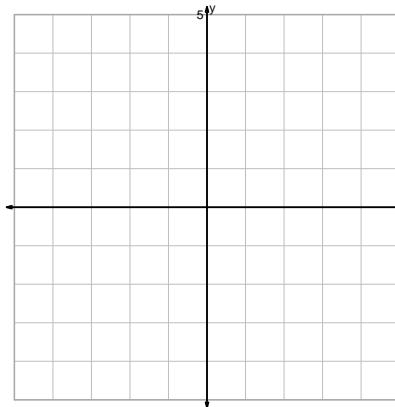
$$y = (x - 2)^3$$



$$y = x^2 - 2$$



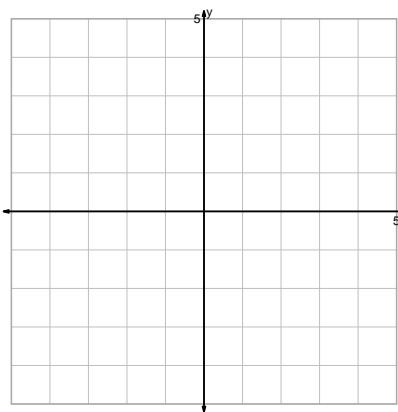
$$y = 2 \cdot \log_2(x)$$



$$y = -\sqrt{x}$$

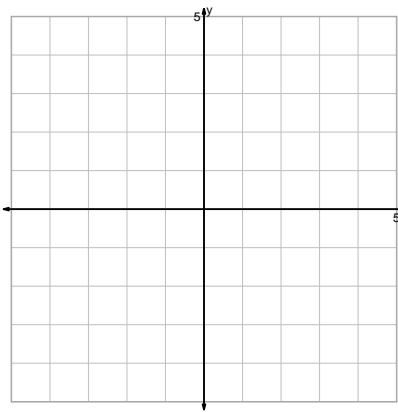
Question 2 continued...

$$y = \left(\frac{x}{2}\right)^3$$



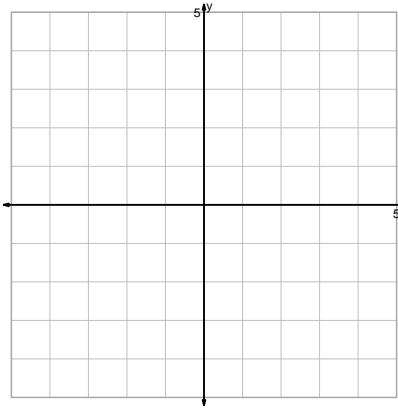
$$y = \sqrt[3]{x+2}$$

$$y = \frac{\sqrt[3]{x}}{2}$$



$$y = \sqrt{x} + 2$$

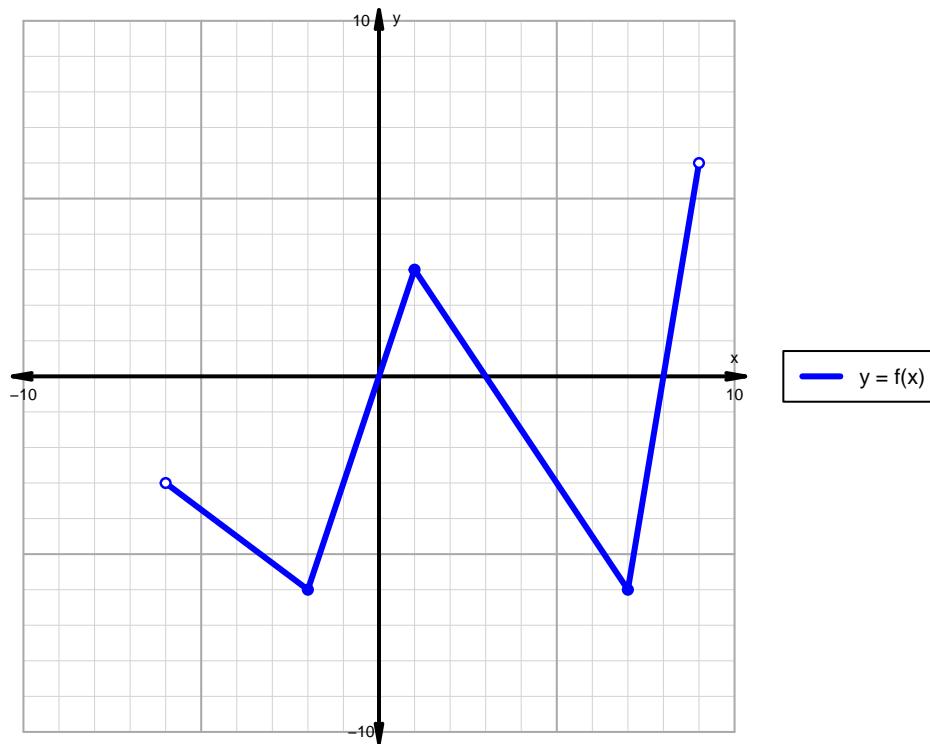
$$y = 2^{2x}$$



$$y = 2^{-x}$$

**Question 3**

A function is graphed below.



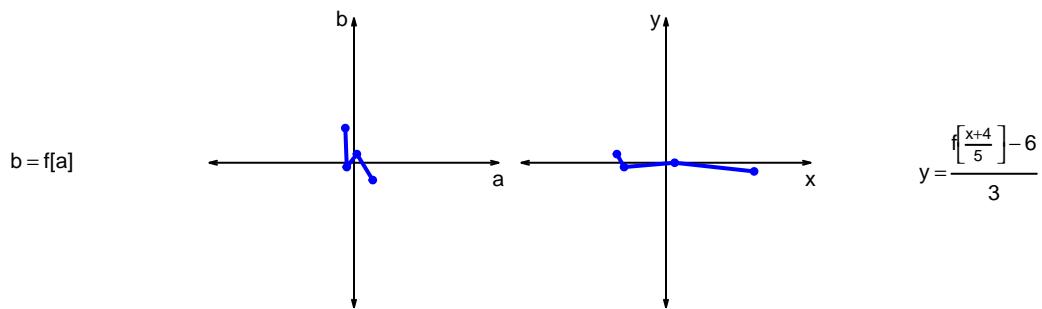
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

## Question 4

Let  $f$  represent a function. The curves  $b = f[a]$  and  $y = \frac{f[\frac{x+4}{5}] - 6}{3}$  are represented below in a table and on graphs.

a	b	x	y
-6	24	-34	6
-5	-3	-29	-3
2	6	6	0
13	-12	61	-6



- a. Write formulas for calculating  $x$  from  $a$  and calculating  $y$  from  $b$ . (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve  $y = f[x]$  into the second curve  $y = \frac{f[\frac{x+4}{5}] - 6}{3}$ ?

### Question 5

A parent square-root function is transformed in the following ways:

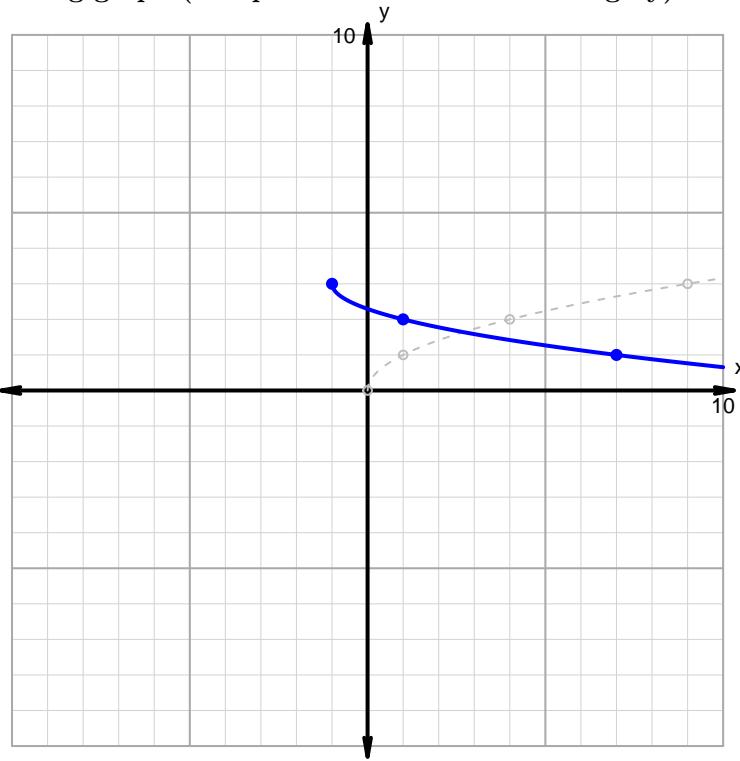
#### Horizontal transformations

1. Horizontal stretch by factor 2.
2. Translate left by distance 1.

#### Vertical transformations

1. Vertical reflection over  $x$  axis.
2. Translate up by distance 3.

Resulting graph (and parent function in dashed grey):

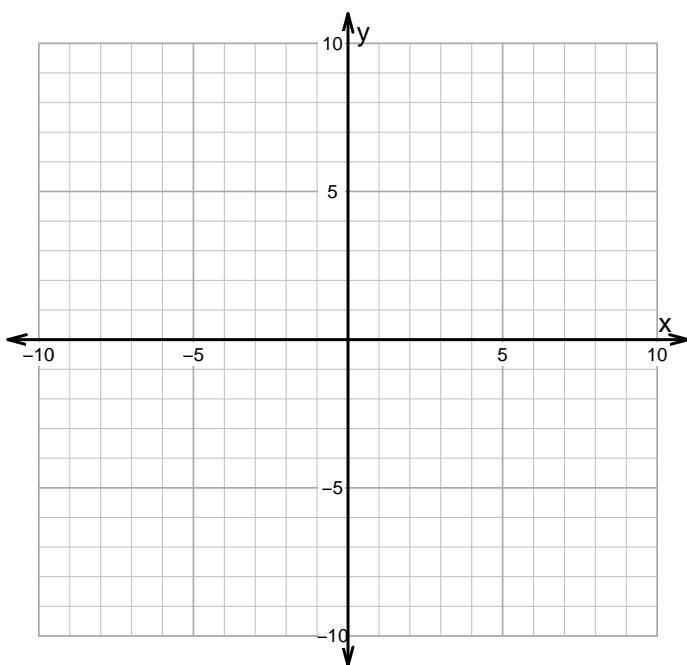


- What is the equation for the curve shown above?

**Question 6**

Make an accurate graph, and describe locations of features.

$$y = 3 \cdot |x - 3| - 9$$



Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	